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✓ General Notions of Organization
and Tactical Suggestions
Indispensable to the Balloon Observer

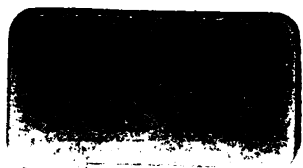
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1918

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SUPPLEMENT

TO THE PAMPHLET ENTITLED

General Notions of Organization and Tactical Suggestions Indispensable to the Balloon Observer

Military Aeronautics Division

NOTE

*This Supplement is intended to supersede
Part I of the pamphlet, which is erroneous
in that it is not up to date*

WASHINGTON
GOVERNMENT PRINTING OFFICE
1918

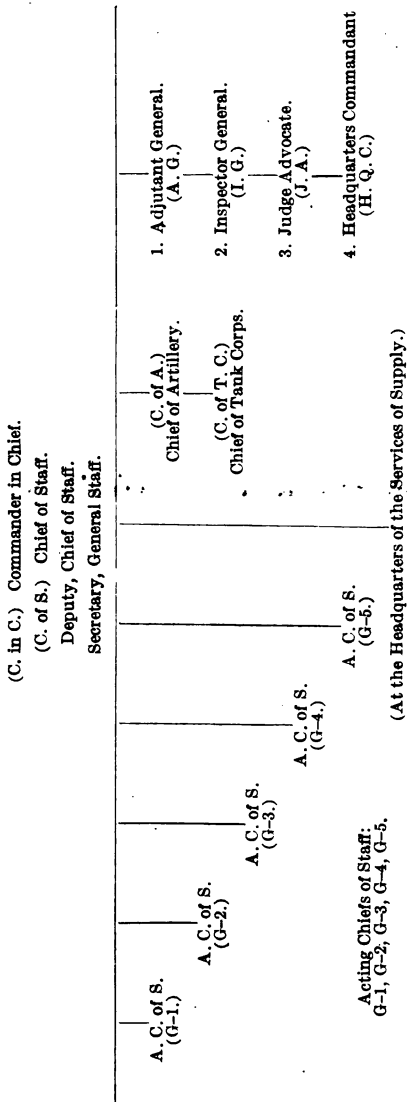
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THE GENERAL STAFF AT THE GENERAL HEADQUARTERS.

DIAGRAM OF THE ORGANIZATION.



Chief Quartermaster (C. Q. M.)	Chief Surgeon (C. S.)	Chief Engineer Officer (C. E. O.)	Chief Ordnance Officer (C. O. O.)	Chief Signal Officer (C. S. O.)	Chief of Air Service (C. A. S.)	General Purchasing Agent (G. P. A.)	Chief of Gas Service (C. G. S.)	Chief of Utilities (C. of U.)	Provost Marshal General (P. M. G.)
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AT THE GENERAL HEADQUARTERS.

MATTERS HANDLED BY THE DIFFERENT SECTIONS, GENERAL STAFF.

First Section, General Staff (G-1).

Ocean tonnage and requisitions on War Department.

Personnel, prisoners of war, replacement of losses, organization, welfare organizations, remount service, etc.

Prepares our order of battle.

Second Section, General Staff (G-2).

Information and intelligence.

Secret service.

Topography. (Prepares and issues maps.)

Censorship.

Intelligence corps.

Third Section, General Staff (G-3).

Strategic studies and plans.

Directs operations against the enemy.

Moves troops.

Concentrates artillery

Strategical and tactical liaison.

Fourth Section, General Staff (G-4).

Supply, construction, and transportation in France.

Hospitals and evacuation of sick and wounded.

Handles labor and labor troops.

Fifth Section, General Staff (G-5).

Instruction and training of the command.

Centers of instruction and the Army schools.

Training manuals, etc.

ADMINISTRATIVE SERVICES.

Adjutant Generals Department.

Routine administration and records.

Blank forms, printing, etc.

Inspector Generals Department.

Investigations and inspections.

Judge Advocate Department.

Courts-martial and military law.

Complete data regarding the work of the General Staff is to be found in G. O. 31, G. H. Q., A. E. F., 1918, as amended.

THE SERVICES OF SUPPLY.

(Army post office 717.)

This is the geographical division in rear of the zone of advance. The services of supply relieves the general headquarters of many details of routine, military, or governmental nature. Its work is mainly concerned with—

Transportation and construction.

Service of territorial command.

Supply, sanitary, and telegraph service (par. 368, F. S. R.).

Technical and administrative services shown in diagram on page 2.

This headquarters was formerly the headquarters, line of communications, and is an elaboration of the line of communications because of the natural expansion caused by an influx of Army troops. It handles all the duties prescribed for the line of communications in the Field Service Regulations. The headquarters, service of supply, in its work, resembles a centralized war department. It is subordinate to the general headquarters.

One of the chief duties of this headquarters is the coordination of the different services.

Duties of the technical and administrative services under the supervision of the commanding general, services of supply, are as follows:

Quartermaster Corps.—Pay of personnel, disbursements, quartermaster material—food, clothing and subsistence, fuel and forage—transportation, remount, laundries, salvage, graves registration service.

Medical Corps.—Hospitals, sanitation, care of sick and wounded, medical and veterinary supplies, personnel and supplies for the gas service.

Corps of Engineers.—Mines, field fortifications, surveys and maps, searchlights, supplies, depots, water, electric light and power, personnel and material, gas and liquid fire offensive, sewage, and camouflage.

Ordnance Department.—Ordnance material of every description, equipment, ammunition depots and dumps.

Signal Corps.—Material, communications, radio, wire, pigeons, photography of military operations, meteorological service.

Air service.—Aeroplanes and balloons; aviation and aero stations; material; organization; aerial reconnaissance observation and photography; aerial combat and bombing.

General purchasing board.—Purchases supplies; adjusts inter-allied accounts; gas service; service of chemical warfare; gas and flame activities.

Service of utilities.—Operation, maintenance, and construction of railways, canals, roads, wharves, shops, and buildings; forestry service; inland water transport; accounts; terminals; motor transport service.

Provost marshal service.—Military police; maintenance of order, traffic; deserters, absentees, and stragglers; prisoners of war; general police work in cooperation with allied authorities.

A complete description of work performed by the services is to be found in G. O. 31, G. H. Q., A. E. F., 1918, as amended.

In the services of supply are the base sections, comprised by the port of debarkation and as a usual rule the French geographic department in which the port is situated.

The chiefs of services are staff officers of the commander in chief, and exercise authority over all troops in their services, except in some cases when services form a permanent part of an army or army corps, or other combat unit in the theater of operations under the direct control of the commander of such unit. The use of these services is then directed by the commander of the unit on the front, but the question of supply, etc., still devolves upon the service as its particular function.

THE ZONE OF ADVANCE.

The zone of advance comprises the territory out of the services of supply in the direction of the enemy. It is divided into sections, the last one being the advance section, zone of advance, which regulates the troops and supplies at its disposal. This takes into account all the combat units and their services in the theater of operations.

THE ARMY GROUP.

At the present time we have no such organization, for the reason of its size. It would be composed of several armies operating toward the same objective for tactical reasons. As used by our allies and our enemies it is a variable organ of command, and as a rule has nothing other than a commanding general, a staff, and a number of pursuit and bombardment groups of the air service for aerial operations within enemy lines. Any number of armies might belong to an army group, owing to the mission to be accomplished.

There is no doubt but what we shall have the army group when we have enough armies to make it a reality and a necessity on account of geographical location of troops.

Our enemies employ this monster organization to good advantage, due to their different theaters of war. Its function is purely strategy and it allows good control over different armies assigned to the same mission or objective. Its worth becomes apparent in great offensives.

THE ARMY.

(Approximately 1,000,000 men.)

It is ordinarily composed of five army corps (strength shown hereafter) and additional troops as follows:

- Army headquarters.
- Army traffic police and headquarters guard.
- 12 regiments Infantry pioneers.
- Army Artillery headquarters.
- 4 brigades, 6-inch guns, motorized (or 5-inch, 6-inch, S. C. or 155-mm. G. P. F.).
- 4 brigades, 8-inch or 9.5-inch howitzers, motorized.
- 5 regiments, F. A. 75, motorized.
- 20 platoons, antiaircraft guns (semimobile), 4.7-inch.
- 9 batteries, 8-inch R. R. guns (36 guns).
- 9 batteries, 10-inch R. R. guns (36 guns).
- 4 batteries, 12-inch R. R. guns (16 guns).
- 10 batteries, 12 R. R. motors (40 motors).
- 8 motor ordnance repair shops.
- 8 ammunition trains.
- Army artillery park.

ENGINEERS.

- 1 regiment, gas and flame.
- 1 regiment, mining.
- 1 regiment, water.
- 1 regiment, supply.
- 1 regiment, electromechanical.
- 1 regiment, road.
- 1 battalion, topographical.
- 1 battalion, camouflage.
- 7 service battalions.
- 10 truck companies.
- 5 wagon companies.
- Army pontoon park and pontoon troops.

TANK CORPS

- 15 heavy companies.
- 60 light companies.
- 8 salvage and repair companies.

SIGNAL CORPS.

- 1 field service battalion.
- 2 telegraph battalions.
- 2 meteorological sections.

AIR SERVICE.

- 24 observation squadrons.
- 15 pursuit squadrons.
- 5 bombardment squadrons.
- 1 photographic section.
- 24 balloon companies.
- 16 air park companies.

SANITARY TROOPS.

- 1 ambulance section, sanitary train.
- 1 field hospital section, sanitary train.
- 8 evacuation hospitals.

ARMY TRAINS.

- 1 supply train (motor).
- 15 truck companies, 3-ton (transport of material).
- 10 truck companies, 3-ton (emergency rations).
- 4 truck companies (motor repair shops).
- 1 remount depot.
- 1 mobile veterinary hospital.

Some of these special troops are drawn from replacement and depot division pertaining to the five Army corps.

The officer commanding the air activities of an army is called, for instance, chief of air service, first army. He is a general officer. The commander of Army balloons is a lieutenant colonel or colonel. They are the technical advisers of the commanding general of the Army regarding technical employment of aeronautics.

THE ARMY CORPS.

(Approximate strength, 182,865.)

An Army corps is composed of the following:

- 1 corps headquarters.
- 4 combat divisions.
- 1 replacement division (replacement and school division).
- 1 depot division (base and training division).

CORPS TROOPS.

- 1 regiment Infantry pioneers.
- 2 regiments of Cavalry.
- 1 Artillery headquarters.
- 1 regiment, 4.7-inch motorized Field Artillery.
- 1 regiment 6-inch motorized Field Artillery.
- (Organization) confidential.
- 1 trench motor battalion (240 mm.).
- 1 antiaircraft 3-inch Field Artillery battalion.
- 1 antiaircraft machine gun battalion.
- 1 corps artillery park (1 motor section, 1 depot section, and 1 mobile ordnance repair shop).
- 1 regiment of engineers.
- 1 pontoon train.
- 1 field signal battalion, Signal Corps.
- 1 telegraph battalion, Signal Corps.
- 1 supply train.
- 1 troop transportation train.
- 1 remount depot.
- 1 mobile veterinary hospital.

In trench warfare the staff of an army corps seldom moves. Troops come and go as the situation requires, but it is the policy for the commanding general and his staff to remain in the same sector. The reason is apparent. In periods of defensive battles the army corps might swell to the size of an army on account of more troops being fed into the battle. The artillery concentration is tremendous. That is what happened to the French at Verdun. Twenty to twenty-five infantry divisions passed under control of one army corps commander.

However, the army corps resumes its normal strength under ordinary conditions.

The organization of the staff at army corps headquarters follow the same general scheme shown under the general headquarters, although not so elaborate, cut down to meet actual requirements of such a small command.

It will be necessary to study in detail the organization of the staff at corps headquarters in order that one may have a proper knowledge of how and who to work with, as the balloon may work directly for the corps. One should know the location of every office and command post in the corps. Soldiers should know the same, as they are likely to be sent with messages.

There will be work to some extent with the second section (G-2) and its adjunct, the Artillery Information Service. Instruction and orders from G-3 about future operations, positions to be taken up in advance, retreat, etc., will be received. This section works out plans for attack in the sector.

Balloon officers will have relations with the corps Air Service commander and the wing commander corps observation W. C. C. O.

Both of these commanders usually have the rank of colonel. Do not confuse *these commanders* with the *commander of Army balloons*; he pertains to the staff of an army.

THE INFANTRY, DIVISION.

(Approximate strength, 27,865.)

The Infantry division is the real combat unit. It moves intact, unlike the Army corps in trench warfare. It is equipped for mobility as a unit, but at the present time has no units of the air service regularly assigned.

It is composed of troops as follows:

- 2 brigades of Infantry.
- 1 Field Artillery brigade (called divisional artillery).
- 3 machine guns battalion (heavy).
- 1 field signal battalion, Signal Corps.
- 1 regiment of Engineers.
- 1 ammunition train.
- 1 mobile ordnance repair shop.
- 1 supply train.
- 1 Sanitary Train (and Field Hospital).
- 2 Brigades Headquarters (Infantry).
- 1 Brigade Headquarters (Artillery).
- Headquarters Troops of Division.

The total armament of an Infantry division is—

- 12 37-mm. cannon.
- 260 heavy machine guns.
- 50 3-inch trench mortars.
- 24 6-inch trench mortars.
- 36 trench mortars (various).
- 768 automatic rifles.
- 17,686 rifles, caliber .30.
- 11,714 pistols.

A quantity of grenades.

Note that three balloons are prescribed for an Army corps. Usually there is one for the Army corps and two for the divisional artillery and such extra heavy artillery normally in the corps troops. It is likely that more balloons would be assigned in case of attack when more artillery was crowded in with the corps troops. Remember that all organizations of units in trench warfare may be varied so as to meet the situation at hand.

AN INFANTRY BRIGADE.

(Approximate strength, 8,415.)

An Infantry brigade is composed of two regiments of Infantry, armament as follows:

- 3 37-mm. cannon.
- 16 heavy machine guns.
- 6 trench mortars.
- 3,201 rifles, caliber .30.
- 192 automatic rifles.
- 1,172 pistols.
- Grenades.

A FIELD ARTILLERY BRIGADE.

(Approximate strength, 4,977.)

A Field Artillery Brigade is composed of—

- 2 regiments of Light Artillery.
- 1 regiment of Heavy Field Artillery.
- 1 trench mortar battery.

Armament as follows:

- 24 3-inch field guns (motorized).
- 24 6-inch field guns (motorized).
- 12 trench mortars.
- 24 antiaircraft machine guns.

A number of .30 caliber rifles and .45 caliber pistols.

The three divisional machine gun battalions are equipped with a total of 160 heavy machine guns.

REGIMENT OF INFANTRY.

(Approximate strength, 3,805.)

Composed of 3 battalions, 15 companies to a regiment, 1 headquarters, 1 supply, 1 machine gun, and 12 rifle companies.

Armed with—

- 37-mm. cannon.
- Trench mortars.
- Heavy machine guns.
- Automatic rifles.
- Rifles, .30 caliber.
- Rifles and hand grenades.
- Knives.

REGIMENT OF LIGHT FIELD ARTILLERY (motorized).

(Approximate strength, 1,542.)

Composed of 2 battalions, 1 headquarters company, 1 supply company, and 6 batteries to a regiment.

Armament:

- 24 field guns (75 mm.).
- 12 antiaircraft machine guns.
- 87 rifles.
- 1,428 pistols.

REGIMENT OF HEAVY FIELD ARTILLERY (motorized).

(Approximate strength, 1,657.)

Composed of 3 battalions, 1 headquarters company, 1 supply company, and 6 batteries to a regiment.

Armament:

- 24 howitzers, 9.2 inches.
- 1,435 rifles.
- 485 pistols.

THE AIR SERVICE.

The general commanding the Air Service is known as the Chief of Air Service (C. A. S.).

A general officer commands the air service of an army. He is known as Chief of Air Service, First Army. He commands the tactical air service of the army.

A lieutenant colonel or colonel commands the balloons of an army. He is known as the commander of army balloons (C. A. B.).

MISCELLANEOUS STATIONS OF THE AIR SERVICE.

Aviation instruction centers (French, England, and Italy).

Aerial observation school.

Balloon school, A. E. F.

School of aerial gunnery (aviation).

Air replacement barracks.

Balloon officers commanding troops or concerned with supply should familiarize themselves with the methods of supply of auto spare parts, etc., by the Motor Transport Service, Service of Utilities. The salvage service can be utilized to some extent for repair of old cars not standardized.

Do not expect to find ordnance and ordnance stores, quartermaster property, subsistence stores, clothing, etc., at air parks. The Air Service supplies its own technical material. The question of general supply still devolves upon the services enumerated on pages 4 and 5.

The following are the tables of organizations of a balloon company, balloon group, and a balloon wing according to Tables of Organization of Air Service, C. H. Q., A. E. F., G-1, Sept. 8, 1918.

TABLE 7.—Balloon Wing, Air Service.

	1	2	3	4	5	6
1	Units.	Head- quarters.	3 groups (Table 8) ^b	Total.	At- tached Medical Department (Table 8).	Aggre- gate.
2	Colonels.....	*1	.....	1	.....	1
3	Lieutenant colonels.....	*1	.....	1	.....	1
4	Majors.....	.....	3	3	.....	3
5	Captains.....	*2	18	20	.....	20
6	First lieutenants.....	*1 ^a	45	46	3	49
7	Second lieutenants.....	.....	60	60	.....	60
8	Total commissioned.....	5	126	131	3	134
9	Master electricians.....	.....	36	36	.....	36
10	Sergeants, first class.....	†1	174	175	18	193
11	Mess sergeants.....	.....	15	15	.....	15
12	Sergeants.....	.....	144	144	3	147
13	Corporals.....	†2	243	245	.....	245
14	Chauffeurs, first class.....	†2	138	140	.....	140
15	Chauffeurs.....	†2	249	251	.....	251
16	Cooks.....	.....	51	51	.....	51
17	Buglers.....	.....	30	30	.....	30
18	Privates, first class.....	†2	525	527	33	560
19	Privates.....	†2	1,065	1,067	15	1,082
20	Total enlisted.....	11	2,670	2,681	69	2,750
21	Aggregate.....	16	2,796	2,812	72	2,884
22	Cars, motor.....	1	18	19	.....	19
23	Motorcycles with side cars.....	2	51	53	.....	53
24	Trucks, motor 3-ton, F. W. D., standard.....	.....	90	90	.....	90
25	Trucks, motor, 1½-ton.....	1	48	49	.....	49
26	Trucks, motor, winch.....	.....	15	15	.....	15
27	Trucks, motor, tender.....	.....	15	15	.....	15
28	Trailers, kitchen, rolling.....	.....	15	15	.....	15
29	Trailers, water-tank.....	.....	15	15	.....	15
30	Balloons.....	.....	15	15	.....	15
31	Pistols.....	5	243	248	.....	248
32	Rifles.....	11	2,553	2,564	.....	2,564
33	Rifles automatic.....	.....	15	15	.....	15
34	Guns, machine, antiaircraft mounts.....	.....	90	.....	90	90

^a Radio officer.

^b Wing headquarters utilized to command all balloon groups in one air brigade.

* Armed with pistol.

† Armed with rifle.

TABLE 8.—*Balloon Group, Air Service.*

	1	2	3	4	5	6
1	Units.	Head- quarters.	5 com- panies (Table 9).	Total.	Medical Depart- ment, at- tached.	Aggre- gate.
2	Majors.....	*1	.....	1	.....	1
3	Captains.....	*1	5	6	.....	6
4	First lieutenants.....	.....	15	15	1	16
5	Second lieutenants.....	.....	20	20	.....	20
6	Total commissioned.....	2	40	42	1	43
7	Master electricians.....	*2	10	12	.....	12
8	Sergeants, first class.....	†3	55	58	6	64
9	Mess sergeants.....	5	5	5	.....	5
10	Sergeants.....	†3	45	48	1	49
11	Corporals.....	†6	75	81	.....	81
12	Chauffeurs, first class.....	†6	40	46	.....	46
13	Chauffeurs.....	†8	75	83	.....	83
14	Cooks.....	*2	15	17	.....	17
15	Buglers.....	.....	10	10	.....	10
16	Privates, first class.....	†5	170	175	11	186
17	Privates.....	†5	350	355	5	360
18	Total enlisted.....	40	850	890	23	913
19	Aggregate.....	42	890	932	24	956
20	Cars, motor, 7-passenger.....	1	5	6	.....	6
21	Motorcycles, with side cars.....	2	15	17	.....	17
22	Trucks, motor, 3-ton F. W. D. stand- ard.....	.....	30	30	.....	30
23	Trucks, motor, 1½-ton.....	1	15	16	.....	16
24	Trucks, motor, winch.....	.....	5	5	.....	5
25	Trucks, motor, tender.....	.....	5	5	.....	5
26	Trailers, kitchen, rolling.....	.....	5	5	.....	5
27	Trailers, water-tank.....	.....	5	5	.....	5
28	Balloons.....	.....	5	5	.....	5
29	Pistols.....	6	75	81	.....	81
30	Rifles.....	36	815	851	.....	851
31	Rifles, automatic.....	.....	5	5	.....	5
32	Guns, machine, antiaircraft mounts.....	.....	30	30	.....	30

*Armed with pistol.

†Armed with rifle.

TABLE 9.—*Balloon Company Air Service.*

	1	2	3	4
1	Units.	Total company.	At- tached Medical Depart- ment.	Aggre- gate.
2	Captains	*1	.....	1
3	First lieutenants	*3 ^{ac}	.....	3
4	Second lieutenants	*4 ^{ac}	.....	4
5	Total commissioned	8	.....	*8
6	Master electricians	*2	.....	2
7	Sergeants, first class ⁵⁵⁵	†11	1	12
8	Mess sergeants	†1	.....	1
9	Sergeants	†9	.....	9
10	Corporals	†15	.....	15
11	Chauffeurs, first class	†8	.....	8
12	Chauffeurs	†15	.....	15
13	Cooks	*3	.....	3
14	Buglers	*2	.....	2
15	Privates, first class	†34	2	36
16	Privates	†70	1	71
17	Total enlisted	170	4	174
18	Aggregate	178	4	182
19	Cars, motor, 7-passenger	1	.....	1
20	Motorcycles, with side cars	3	.....	3
21	Trucks, motor, 3-ton F. W. D. standard	6	.....	6
22	Trucks, motor, 1½-ton	3	.....	3
23	Trucks, motor, winch	1	.....	1
24	Trucks, tender	1	.....	1
25	Trailers, kitchen, rolling	1	.....	*1
26	Trailers, water-tank	1	.....	1
27	Trailers	1	.....	1
28	Pistols	15	.....	15
29	Rifles	163	.....	163
30	Rifles, automatic	1	.....	1
31	Guns, machine, antiaircraft mounts	6	6

° Observer.

*Armed with pistol.

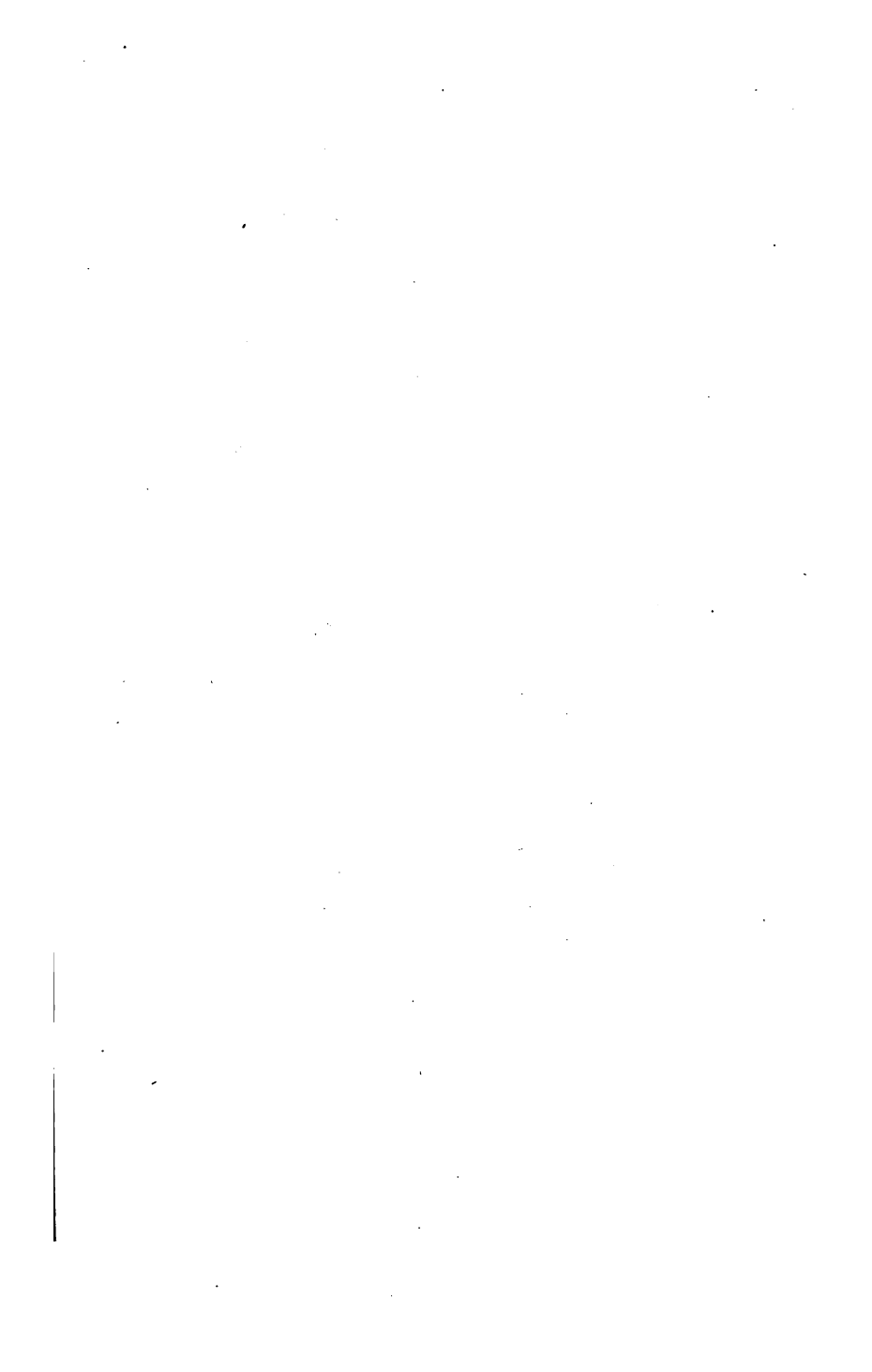
†Armed with rifle.

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General Notions of Organization and Tactical Suggestions Indispensable to the Balloon Observer

**ISSUED BY
DIVISION OF MILITARY AERONAUTICS
U. S. ARMY**



**INFORMATION GIVEN BY FRENCH INSTRUCTORS
TO ARMY BALLOON SCHOOL,
AMERICAN EXPEDITIONARY FORCES**

**WASHINGTON
GOVERNMENT PRINTING OFFICE
1918**



GENERAL NOTIONS OF ORGANIZATION AND TACTICAL SUGGESTIONS INDISPENSABLE TO THE BALLOON OBSERVER.

This lecture will be composed of three parts, treating three questions of a very different nature.

Part 1. Summary showing the general nature of the organization of large units and their staffs, and indicating the authorities with whom the balloon companies may have to deal.

Part 2. Tactical information as to what is seen by the balloon, and on facts which must more particularly demand its attention.

Part 3. Finally, a few words on the battle, without going into details of execution, limited to the general features which every officer, whatever be his arm, must know at the present time.

PART 1. QUESTIONS OF ORGANIZATIONS.

G. H. Q.—The G. H. Q., which everybody knows, be it only by the newspaper controversies, will be mentioned only for the sake of completeness. On its staff there is a colonel or lieutenant colonel bearing the title of **chief of the Army Air Service**. He is the technical adviser of the commander in chief for all that concerns the technical use of aeronautics.

Group of armies.—The group of armies is an essentially variable organ. Its necessity had not been made apparent before the war, but the experience of the first months of the war proved it to be difficult for the commander in chief to command directly a great number of armies. The commander in chief has thus created provisional groups; at the time of the battle of the Yser we thus had a group of Northern Armies under command of Gen. Foch, who bore the title of assistant to the general in chief; later on, the **provisional Eastern Group** was created.

The idea of constituting groups of armies gaining ground, three groups of armies were then created (G. A. E., G. A. C., G. A. N., groups of Eastern, Center, and Northern Armies), between which the whole of the French forces on the occidental front were distributed.

These groups of armies remained organs of command and amounted merely to a general commanding a group of armies and his staff, having at his disposal a certain number of armies and of a few formations independent of armies (for instance, combat and bombardment groups of aviation), but without the complicated services which burden the G. H. Q. on the one hand and the armies and inferior large units on the other.

It seemed for a long time that this organization was definite and that a new echelon was thus created. During the last few weeks this conception seems to have undergone an evolution. It is not impossible that one may fall back to the notion of groups of armies, comprising a certain number of armies constituted with specified operations, in view of the other armies depending directly on the general headquarters.

As far as we are concerned, it will be sufficient to remember that in the staff of any constituted army group there is a field air officer, who is the technical advisor of the general commanding the group of armies as to the technical use of aeronautics; this field officer exercises a direct command over the aeronautical units included in the group of armies without being assigned to the armies.

Army.—The army has an essential importance in the present war. It is not, like a group of armies, merely tactical; it constitutes an indispensable and regular organ under the orders of a general commander provided with a staff, troops, and services.

The large unit "army" did not exist before the war, but it was arranged for and constituted on paper. The general, the staff, and the services worked together during staff journeys and maneuvers. This organism materialized at the time of mobilization, and the large existing units (Army Corps and divisions of Infantry) were distributed among the various armies.

The large units are assigned only provisionally to an army, and they go from one army to another, according to the necessities of the maneuvers. It is thus that in the IVth Army we witness a constant arrival of Army Corps and divisions coming from Verdun or Picardy.

Each army comprises a permanent nucleus—command, staff, services.

The army headquarters are divided into two groups:

The first group comprises the staff proper, with the directors of certain services at the front; general commanding the Artillery, general commanding the Engineers, chief of the First Line Telegraph Service, chief of the Army Air Service. The very titles of these service directors show the nature of their duties. The chief of the Army Air Service is a field officer (major or lieutenant colonel); he is technical adviser to the army commander as to the technical use of aeronautics; he exercises a direct command over the aeronautical units included in the army that are not assigned to the various army corps; he superintends and controls the technical use of aeronautical units assigned to these army corps.

The army commander may call on him to take over the command of the aeronautical units concentrated for an operation in an army corps or an organized group, by the side of the commander of this army corps or group.

The second group of the army headquarters comprises the chief of the lines of communication and services, the name of which speaks for itself. The general chief of the lines of communications and services is, as a rule, a general of division, depending on the general commanding the army, in the same capacity as a general commanding an army corps. As chief of the lines of communication, he has authority over a large zone of terrain, which extends over a square, corresponding to

the front of the whole army, between the forward limits of the zone of the line of communications and the rear limits of the army; as chief of the services, he has authority over the chiefs of services not included in the first group, Quartermaster Corps, Medical and Veterinary Services, post office, treasury, etc.

The object of the direction of lines of communication and services is to relieve the army commander of all matters other than the direction of operations; the general chief of lines of communication and services is intrusted by the general commanding the army with solving all these matters. His high rank enables him to give orders even to directors of services having rank of generals of division, as quartermaster generals and surgeon generals. His rôle is more difficult with army corps generals, with whom he must deal on administrative questions, and, when an important matter has to be solved, it is generally submitted to the decision and signature of the general commanding the army.

Army Corps.—The Army Corps is the most important large unit that was already constituted in time of peace. Its constitution is known by all, and we will not dwell on the matter, but will call attention to the evolution which it has undergone. It was formerly admitted that the Army Corps formed a whole, an indissoluble block, which could be transported as it was from one end of the front to the other, with its commander, staff, troops, and services; this was, besides the difference in size, the essential distinction between the large unit "army" and the other large unit "army corps." In fact, the experience of the war, the modifications in armament, the increase in artillery, have necessitated serious modifications in the composition of the Army Corps, the most striking of which are the creation of army corps with three or four Divisions of Infantry, the creation of an army corps heavy artillery, and the creation of army corps aeronautics. But it was mainly in the way of using army corps that the logic of events and the pressure of necessity brought about a real revolution which dates from the Battle of Verdun; the army corps were pulled to pieces, broken up; the staffs stayed where they were with the total or a part of their elements that did not belong to any one division, and their divisions were placed at the disposal of other army corps commanders, and engaged by them in the battle. One saw at Verdun army corps commanders through whose hands passed

20 to 25 divisions of infantry, coming from all parts of the front. Under such conditions, the number of the army corps became illusive; the army corps disappeared to give place to groups; the large units "Army Corps" had thus the character of the large unit "army," a permanent organization framing together variable units.

However, the analogy is not absolute. What has just been expressed for the army corps happened in the defensive battle of Verdun. For the same reason the process had to extend to most of the army corps holding the front in calm sectors. But the general in chief has always endeavored to give their normal constitution to army corps that are to be engaged in an offensive action on account of the necessity of a perfect understanding between the command and the troops. The breaking up of army corps has been a necessity; it is not a rule; and one always falls back as soon as possible into the old track.

Division.—The division of infantry is the smallest of the large units.

It forms the real unit of combat. It is transported as a whole for defensive and offensive purposes without being broken up like the Army Corps. Since the beginning of the war its composition has been very much modified. Formerly it scarcely comprised anything but fighting elements. It had very few services and used those of the Army Corps. During the war the ideas in this regard changed altogether; the services of the Army Corps were lessened little by little and given in part to the divisions of Infantry, which were thus endowed with—

An Artillery park.

An Engineer park.

A subsistence supply train.

A cattle train, with a section of fresh-meat supply.

Ambulances and hospital sections.

An automobile sanitary section, etc.

The division may thus, like the former independent divisions of Infantry, carry on an existence of its own and work by itself, but it has become considerably less mobile.

Composition of a staff.—Now, a few words about the staffs of Army Corps and divisions of Infantry, and the relations that officers of the Air Service must maintain with them.

The Army Corps Staff is under the direction of a chief and assistant chief of staff. It comprises three bureaus and a mail section.

The **first bureau** looks after matters of supply, personnel, and matériel.

The **second bureau** looks after the intelligence service.

The **third bureau** looks after operations, properly speaking.

The **mail section** receives the papers arriving, classifies them, and forwards them to each bureau concerned; inversely, it receives the papers sent by the bureaus and forwards them to their destination. It has at its disposal the means of transport of the staff, motor cars, motorcycles, etc. **Officers not belonging to the staff** and wishing to be introduced into the bureaus **must report to this section.**

In the staff of a Division of Infantry the classification is the same, but officers are not so numerous, and there is no assistant chief of staff.

The chiefs of the large services, similar to those we have seen in the Army headquarters, belong to the Army Corps headquarters; the most interesting is the **general commanding the Corps Artillery**, who himself has under his orders the colonel commanding the heavy artillery. A **colonel commanding the Divisional Artillery** belongs in the same way to the divisional headquarters.

As a rule the division commands directly its Divisional Artillery and the heavy **short** artillery; the colonel commanding the Army Corps heavy artillery commands directly the heavy **long** artillery.

What may your personal intercourses with the headquarters be?

According to the terms of Supplement II of the Instructions of December 16, 1916, concerning the object and conditions of an offensive action of ensemble, the aerial means of an army corps, which include, as regards aerostatics, three or four balloons, are grouped under the orders of a commander of the army corps air service. It is evidently he who takes the orders from the command, but the observers must nevertheless keep closely in touch both with the staffs of the army corps or infantry divisions and with the colonel commanding the heavy artillery. When you have to deal with staffs it is advisable to warn you that **you must not handle the questions** by going directly to the general or the chief or assistant chief of staff, **but by going to the bureau concerned.** This rule does not appear in any regulations, but it is necessary, and more so the more important staff. The bureau concerned will not fail to inform

you, to keep you in touch, and to have you then taken, if necessary, to the chief of staff, or even to the general, who will decide. **These military channels prevent oversights and useless repetition** and allow the work to be carried out with order and method.

The bureau most frequently dealt with is the **second bureau** (intelligence), with the elements attached to it. On account of its importance I will do more than simply mention it.

There exists a sort of natural relationship between the information given by the balloon and that given by the avion. There exists besides a close relationship between most of their missions—artillery ranging, information about hostile organization's first lines and rear, about movements of columns and trains. This is why aerostation and aviation were combined under one chief of **Air Service**.

The information they give arrives under various forms, concerns different objects, and is so voluminous that it must be sorted, copied, and coordinated before being handed to the authority who is to use it. This first coordination must be done by officers belonging to the very service which collected it in order that the command or its agents receive only information already checked, controlled, and set up for immediate exploitation. This is the rôle of the **Air Intelligence Service**, which must make clear and condensed the information it receives. This first work is done by the Intelligence Service officer, assistant to the army corps Air Service commander.

Important as the information thus obtained may be, we know that other information arriving from other sources also has its value, information from terrestrial observation posts, telephone listening posts, examination of prisoners. They may contradict the latter, or confirm it, complete, or specify it. The necessity of coordination is evident. **This coordination can not be made by the general himself**, who is wholly taken up by the duties of his command, and devolves upon the **second bureau** of his staff, which is aware of his intentions and will centralize for him all information received and will give it to him in time in complete form.

The second bureau has an immediate auxiliary, which is the topographic section. In the Army Corps, where it always exists, it is called the S. T. C. A. (Army Corps Topographic Section). In divisions of Infantry, where it does not always exist, it is called the S. T. D. (Division of Infantry Topographic Section).

Army Corps Topographic Service.—In the present war a large part of our information comes from the photographs of hostile organizations taken from avions or even from well-chosen observation posts.

But if everybody recognizes the main lines of a good photograph of a calm sector the same is not true when it comes to details. Especially in an active period when bombardments have begun their work of destruction, this task must be given to specialists, carefully trained in this sort of work, who will search these photographs in order to discover hidden organizations and determine their state and function.

They will draw up the result of their work in maps clear and complete, which will be multiplied as much as required to accompany the photographs and make all details plain to everyone, command and troops. These specialists constitute the **Army Corps Topographic Service.**

The photographs coming from the Air Service are thus handed to the S. T. C. A., with the indications strictly necessary to enable the locating of the photographs in space. The S. T. C. A. will interpret these photographs, then reproduce the interpretation on special maps that will be multiplied as much as necessary, so as to have everybody provided with them.

S. R. A. (Artillery Intelligence Service).—Another annex of the second bureau is the **Artillery Intelligence Service**, which is at the same time an annex to the **Artillery command.**

This service has at its disposal a certain number of special organs, sections of sound and flash registration, small observation posts. It receives, besides, from avions and balloons, all information concerning the enemy's artillery. The second bureau acquaints it immediately with all the information that arrives of interest to the Artillery, and, in the same way, receives from it as it comes all the information that directly concerns the second bureau.

The S. R. A. represents finally a decentralization of the second bureau as far as concerns the Artillery, a decentralization which explains itself in consideration of special technology.

I will not, gentlemen, carry any further the study of the questions of organization. My object was only to remind you of the general notions that any officer of the Air Service should be acquainted with in order to know what element of the staff he should address, according to the nature of the questions he has to handle.

PART 2. TACTICAL INFORMATION ON WHAT IS SEEN FROM THE BALLOON AND FACTS WHICH MUST MORE PARTICULARLY CLAIM THE ATTENTION.

We will not speak here of the special missions which devolve upon the balloon—Infantry balloon or Artillery balloon. You already know them. We will only speak of the services rendered by what may be called the intelligence balloon. It is rare but not impossible that a balloon receives as its only mission the informing of the command of what is being carried on in the enemy's zone. In any case, any balloon that rises fulfills, to a certain extent, a general mission of observation; it notes anything of interest it sees. Every balloon observer must know the possible explanation of what he sees, so as to focus his attention upon the principal things. Above all remember—impress this idea upon your mind—that any information must answer the questions **what** (definition of what has been seen), **when** (day and hour), **where** (indication of the spot), **how** (troops on the march or halted artillery in action or not, etc.).

Infantry.—The observers may see infantry in column. In such case it is relatively easy for him to reckon the effective force of the same. This effective force is inferred from the length of the column, or, what comes to the same thing, from the time it takes to march past a given point.

The following table contains the information concerning the strength of infantry, the length of columns, the time necessary to march past a certain point. These numbers are very approximate:

Unit.	Strength.		Length in column of fours.		Time necessary to march past.	
	Men.	Wagons.	Without wagons.	With wagons.	Without wagons.	With wagons.
Company with 3 zugs or platoons.....	2 to 300	5	<i>Meters.</i> 100	<i>Meters.</i> 100	<i>Minutes.</i> 1	<i>Minutes.</i> 1
Battalion (4 companies).....	8 to 900	25	400	500	6	7
Regiment (3 battalions).....	2,500	90 to 100	1,500	2,000	20	25
Brigade (2 regiments)	5,000	180 to 200	3,000	4,000	45	50 to 60

If the infantry does not march in column of fours but in column of twos, you will double the number given by the table for a given time necessary to march past.

The estimation of the number of companies or battalions is made easier by the distances between units taken at the departure, so as to avoid jamming of the column on the march. But notice that the distances grow shorter, and may even disappear after a march of a certain length on account of the foreseen and unavoidable lengthening of all columns. The end of each unit, from the battalion up, will generally be made evident by the presence of wagons that are the more numerous because the present war necessitates a more considerable matériel, and because the state of men insufficiently trained to march requires more wagons for the transportation of packs and footsore men.

Usually you will not be able to indicate the number of companies, battalions, or regiments, in which case it is better to refrain from being so precise when there is a chance of being wrong. The command will always consider as very precious information stating "a column of infantry of a certain length" or "taking a certain time to march past was following, on such and such day, at such and such hour, the road going from point A to point B." The command does not require any more to come to conclusions, and it will declare itself satisfied.

When infantry is visible not in column but in line or scattered, any estimate of strength becomes very difficult; we have here no longer the accurate bases which the length of the column or the time necessary to march past gave us just now. The estimate becomes guesswork. Let us hasten to remark that here the indication of the effective force may be replaced by other indications of like value.

A large unit does not move over long distances otherwise than in columns; if it deploys, it is to march to combat; and then the information interesting the command is the front over which the advance is carried on, the number of successive lines, the density of these lines, the presence or absence of small columns—all information which you are able to give.

Artillery.—The German artillery comprises a large variety of calibers, which brings about no less a variety of units.

You know how to recognize batteries in action, and we will not insist on this matter. What is of interest to you here regarding the general observation is the artillery in movement. We experienced the same difficulty as for infantry when we wish

to determine the number of units—batteries, battalions. Difficulties are made greater by the variations, which we sometimes do not know, as to the number of guns in a battery (the battery of 77, for instance, has been brought down from six to four guns).

Following you will find a few figures in connection with strength, length, and time to march past a given point. It must be noticed that batteries often divide into two—firing battery and battery echelon. One must thus beware of information giving only the length when making an estimate of strength. A column of 1,000 meters may represent a battalion, with its echelon, or only the firing units of a regiment.

Units.	Strength.			Length of columns by guns.		Time to march past at a walk.	
	Men.	Wagons.	Guns.	Firing battery.	Echelon battery.	Firing unit.	Echelon unit.
Battery of 4 guns.....	170	25	4	<i>Meters.</i> 170	<i>Meters.</i> 350	<i>Minutes</i> 2	<i>Minutes</i> 5
Battalion of 3 batteries..	500	80	12	500	1,000	7	15
Regiment of 2 battalions.	1,200	180-200	24	1,000	2,000	15	30

There is one difficulty. In periods of movements when the safety no longer exists which the occupation of the trenches give to the zone in the rear, the artillery is not displaced by itself on account of the impossibility in which it would find itself of facing a sudden attack and taking without preparation its combat formation. It marches with the infantry, at the rate of march of the latter, between the battalions. You may thus have to distinguish if the columns you see are not columns of all arms, including artillery, and in what proportion. At a certain distance one may be unable to distinguish between the wagons of the infantry combat train, intercalated in the columns, and the artillery wagons, guns, and caissons of a column of all arms.

Nowadays batteries are safe from any sudden attack through the form taken on by the flight. Therefore artillery units are displaced on the battle field without infantry support. These movements are executed mainly by night, in order that the occupation or abandoning of battery emplacement may escape aerial investigations.

However, in the course of offensive action balloon observers may happen to see artillery units pushing forward in daytime to take position.

Cavalry.—The present form of the war prevents cavalry from showing itself in the vicinity of the front. Here, however, is information connected with its strength, the length of the columns, the time necessary to march past a given point.

Units.	Strength.			Length in columns of fours.	Time to march past.		Observations.
	Men.	Horses.	Wagons.		Without regimental train.	With regimental train.	
Squadron.....	120	150	2	<i>Meters.</i> 120	<i>Minutes</i> 2	<i>Minutes</i> 3	The time required to march past at a trot is half of the time required when at a walk.
Regiment with four squadrons.	500	600	15 to 20	600	6	7	

All the above indications concern troops which you may see in your field of observation.

Let us study now another kind of observation, that of railroads and motor trucks.

You know the importance of the preservation of the military organism. The transport by rail and convoys during this war has exceeded all expectations. The slowness of the combat, the enormous quantity of matériel and ammunition expended by the artillery, the construction of trenches and dugouts have created an intense life at the rear. The modifications occurring in the movements of trains and convoys are precious signs, permitting one to infer the efforts of the enemy, the nature of his schemes, and the variations of his forces.

In time of peace one supply train per Army Corps was allowed.

This train was called the supply train No. 2, and comprised as an average:

	Wagons.
For 1 Army Corps with 2 divisions.....	30
For 1 division of Infantry of an Army Corps.....	10

Wagons.

For 1 division of Infantry and independent elements of an Army Corps	20
For 1 division of Infantry, independent.....	15
For 1 division of Cavalry.....	10

The Army Corps train of 30 wagons comprised about 150 tons of supplies. But nobody figured on such a "stagnation" and one hoped to find supplies and many forage on the spot.

Now the country occupied can no longer feed the troops which are settled on it; everything must come from the rear, and the tonnage transported has at least doubled. It may be admitted that with the forwarding of bundles of clothing, of packages for the men, forages, liquids, etc., the tonnage of all that is needed for the life of an Army Corps requires two daily trains of 150 to 200 tons each.

To this traffic must be added the forwarding of engineering and artillery matériel. The tonnage of this matériel varies considerably with the circumstances of war. In periods of calm it is not over 10 cars for a normal Army Corps; in periods of operations it grows in a tremendous proportion. The instruction of December 16 on the offensive of ensemble tells us that the daily tonnage has at times attained 1,200 tons for an Army Corps having two divisions engaged only for the artillery service. This tonnage represents about 150 to 200 cars.

To sum up, the daily traffic of a normal Army Corps varies under ordinary conditions in the vicinity of 50, 60, or 70 cars, distributed in three or four trains. Returning trains carry back matériel out of order and slightly sick men. As long as the number of up and down trains does not exceed that number on the front corresponding to an Army Corps in a quiet sector there is no reason to wonder.

The arrivals by normal tracks are carried away from the stations by wagons, trucks, and narrow trucks (1 meter, 60 centimeter, and 40 centimeters). It is very difficult to follow up to the units the distribution of these stocks of supplies and matériel. Movements are mainly done at night by isolated wagons and trucks—by small cars in small numbers circulating on courses, most of the time defiladed.

Besides the number of these wagons, trucks, and cars is not very important in the hypothesis of the quiet front. You may reckon its approximate number knowing that a park wagon carries an average load of 1,200 kilograms; a motor truck, 2 to 3

tons. On the 60 cm. track a flat car, 5 to 6 tons; cars that can be coupled, 4 to 5 tons per car. On the 40 cm. track a flat car, 4 to 500 kilograms; a miner's car, 3 to 400 kilograms.

The total number is, as a matter of fact, rather small in quiet periods. It becomes considerable when the density of troops increases (which is the case of active sectors where an Army Corps with two divisions in line holds no longer a front of 10 to 12 kilometers, but one of 4 to 5), and when the tonnage of engineering and artillery matériel, instead of being from 8 to 10 wagons for a front of 10 to 12 kilometers, reaches 100, 150, or 200 wagons for a front of 4 to 5 kilometers.

There is another point to be called to your attention. This is the transport of troops.

By normal track, the number of necessary trains amounts to :

	Trains.
For a division.....	35 to 40
For elements independent of a division.....	30
For a normal Army Corps with 2 divisions.....	100 to 120
For a division of Cavalry with 3 brigades to.....	30

One should know that normally one battalion, one battery, one squadron are each carried by one train.

As regards the transport by motor truck, it is figured that a motor truck carries from 10 to 12 men; 15 to 18 motor trucks carry a company.

With the above elements you have a few data enabling you to estimate **any unusual activity** in the sector you are facing. You know its normal physiognomy studied at leisure during periods of calm; you will bring a special care as soon as you will notice **an increase in the number of trains, motor trucks, or cars** on narrow tracks. Any increase of activity in these elements is of the greatest importance. It may mean a narrowing of the front and an arrival of matériel with a view to preparing an attack. In both cases the information is precious.

PART 3. SUGGESTIONS ON COMBAT.

We will speak only of the offensive battle, since it is the one we are preparing and which we are hoping for. Knowing this form of the battle, you will be able to have an exact idea of what the **defensive** battle looks like, at least for a balloon observer, who needs only to know its general outline. On the other hand, this discourse will not enter into the details of the Infantry combat, because this has been covered by the teachings of Commandant Faury. The most striking features of the front-breaking battle, as it is conceived nowadays, will be pointed out, and by means of which we wish to make in the immense fortified front which has been stopping us for so long, large breaches through which entire divisions would pass, with a view to thorough exploitation, to open warfare, to maneuvering.

The following rules have been formulated :

1. **Attacks will be made on as large a front as possible**, for any attack on a narrow front the enemy meets by a concentration of fires that stops the assailant. The extent to assign to a front of attack depends essentially upon the means at one's disposal.

2. **The object of the attacks will be to carry the hostile line of Artillery**, so as to disorganize the defense by the capture of its guns.

3. **The effect of surprise will be sought after** by attacking with a great accumulation of means, while the enemy, unsuspecting, has only at his disposal the means of a calm sector, or, when warned too late, he has not been able to reinforce these insufficient means in time.

4. **The attacks that are part of an operation will succeed one another in the shortest time** in order to thoroughly exploit the results obtained, and to reduce to the minimum the time which the enemy may have to reestablish the situation.

For the attack, the command will begin by placing a certain number of Army Corps in juxtaposition. The Army Corps engaged will be disposed in depth. An Army Corps constituted with four divisions of Infantry will generally place two divisions in line and two in reserve; the division will place in the front line only the forces strictly necessary.

The first act of the battle is the **preparation of the attack.**

This phase concerns mainly the **Artillery** (field, trench, heavy artillery) which must open the way for the Infantry.

Its **first task** consists in engaging the fight against the hostile artillery, endeavoring to **destroy it.** This is called counterbattery work. This fight, which begins before the battle and is carried throughout, is based on the knowledge, as exact as possible, of hostile battery emplacements and observation posts. Their list must be kept up to date constantly by the Army Corps and Army Artillery Intelligence Service, which is spoken of above.

Destruction of artillery requires numerous accurate fires executed with the appropriate calibers, either heavy long artillery (120 long, 155 long) or high-power heavy artillery or big mortars (270, 280); it requires a continuous and methodical work.

The fight against hostile artillery is directed and organized in the Army and Army Corps by the general commanding the Artillery; as you may see it does not depend as a rule on the generals of division, but that will not prevent, if necessary, the cooperation of divisional artillery in counterbattery work.

It is not sufficient to try to destroy the enemy's artillery. One must still destroy his defensive organizations and submit them, before any attack, to an action of artillery, the object of which is to destroy the obstacles in the way of the infantry (barbed wire, entanglements, chevaux de frise, etc.), and the principal organs of the defense (strong points, machine-gun emplacements, observation-command posts, dugouts, place of arms, etc.); to wear away the fighting spirit in the surviving defenders through the demoralizing effects of these accurate, powerful, and continuous fires.

These destruction fires, the objects of which are to crush, to level everything, to transform the enemy's organization into a shapeless chaos, are defined by a picturesque word, which made its way, the "hammering."

The calibers most often used are the 58 and 240 as trench artillery, the 155 short and 220 as heavy short artillery.

For very resisting strong points, such as villages provided with deep dugouts, one should use the heavy and very heavy mortars, such as 340 (trench),¹ 220, 270, and 400, which produce considerable crushing-in effects. The destruction of defensive organizations is directed in principle by the generals of divi-

¹ This mortar has been suppressed on account of the danger it presented in its handling.—Note of translator.

sions and the colonels commanding the divisional artilleries; it goes without saying that each divisional artillery is considerably increased in the way of means, and that generally all the heavy **short** artillery is attached to it.

The control of the work of destruction is of a leading importance, for an insufficient destruction would expose the infantry later on to a deadly failure. This control is obtained by the study of aerial photographs, by the personal observations of the generals and staff officers, by reports of patrols specially sent out.

Another arm that works actively during the preparation phase is the aviation. It must, outside of its cooperation with artillery for range work:

1. Make the reconnaissance or observation of our positions impossible to the aerial organs of the enemy. For this purpose it endeavors to gain the absolute mastery of the air by destroying any **drachen** ("sausage" balloon) that rises or any avion that tries to intervene in the fight.

2. Bombard systematically the spotted ammunition and matériel depots, cantonments, camps, headquarters, stations, and disembarking places; in a word, all important hostile points out of the range of our heavy artillery.

Second phase.—The first phase, the so-called preparation phase, after three or four days, sometimes more, has come to an end. The hostile artillery is badly damaged and our own artillery is ready to neutralize by violent fires any undestroyed battery that may try to enter into action. The enemy's organization has been hammered as far as a range of our guns permits. The aviation has obtained in a more or less complete manner the mastery of the air. The command determines the day, **D**, of the attack. After making sure of destructions and taking into account atmospheric conditions and visibility, the command determines the hour, **H**, at which the attack will start.

The infantry has been given distant points of direction, and in this direction a series of successive objectives.

The units must march on to their objectives without being influenced in their speed by the adjoining units, and stop only when local resistance demands it. The attack must be regulated so as to preserve the cohesion, without which the command can no longer use its forces. For infantry, order is above rapidity.

Echeloned dispositions, including units of assault and units of reserve, are taken when attacking.

The units of assault debouch altogether from the trenches and parallels. This debouching takes place during the latter part of the firing on the enemy's trenches, the infantry endeavoring to reach these trenches in good order, when the artillery has just lengthened its range.

How will the Artillery protect our Infantry during the attack?

In order to silence the hostile batteries endeavoring to execute a barrage, our Artillery will either have to destroy them by keeping up the preparation phase or neutralize them by violent and rapid actions (75 and 105) or by special shells (gas) fired for a certain length of time.

Our Artillery will have to support the Infantry attack by preventing the defenders of the attacked zone from taking position in the trenches and approach trenches and mount any machine guns. For this purpose the Artillery fire must constantly and closely precede the Infantry in order to clear the terrain. The Artillery progressively sweep the terrain over which the Infantry is about to rush and stops its fire during a certain time on the intermediate line which is the objective of the rush, executing a barrage so as to render possible the end of the approach and the setting in order of the Infantry; then the range is lengthened at a given hour or at a given signal, and so on. This is the *creeping barrage*. This system of fire constitutes the *direct support* of each attack.

Finally, our Artillery will have to cover the attack ahead or on the flanks against interventions of all kinds that may come from those not yet attacked; isolate the attacked zone by interdiction fires on all its immediate approaches (trenches and approach trenches), as well as distant tracks, roads, etc., systematically sweep the probable assembling zones of the enemy, and take instantaneously, under a rapid fire, hostile counterattacks; maintain during the operation, as long as the command will find it necessary, a protection barrage on the whole extent of the front and flanks of the attack. This system of fire constitutes the *ensemble covering* of the attacks.

As you see, when all the artillery action is carried out according to provision (and this is what happened at Verdun on the 24th of October and the 15th of December), the hostile artillery acts with extreme difficulty, and the enemy's infantry is decimated and demoralized.

On the other hand, our Infantry is supported, carried on.

The units of assault which have been described above, on setting out from parallels, clear the overthrown accessory defenses; they move boldly forward without getting into the trenches which they meet on the way; they keep as close as possible to the creeping barrage, which they see, and from which they receive a few fragments, causing a few casualties; these casualties are very small compared to those the hostile fire would inflict if the Artillery protection barrage did not prevent it, and the Infantry submits to it as it is the very condition of success.

The Infantry makes more or less long halts on intermediate objectives, agreed on beforehand with the batteries of accompaniment; the units of assault get into order again, the so-called clearing up fractions explore methodically all captured trenches and kill or take prisoners all Germans they meet.

Once in order again, the assaulting troops march on at a given hour, or at an agreed signal, with a view to capturing a new objective, always under protection of the Artillery.

The reserves follow the advance of the assault units, ready to reinforce them or to maneuver according to the incidents of the combat; the officers and the noncommissioned officers keep the latter in order and preserve them from the premature attraction of the line of fire; the reserves keep very close to the assaulting troops, as long as they are still able to advance. When the latter are exhausted, part of the reserves get beyond them, making thus "a passing of the line"; they boldly advance, becoming assault troops themselves, followed by the reserves that are not yet engaged, while the first units of assault occupy the captured ground and begin hastily its defensive organization.

Finally, the attack stops, either because the farthest objectives have been reached or because the Infantry is stopped by a hostile position, the carrying of which is recognized as impossible without a new preparation of Artillery; the aeroplanes fly over the first line, which is marked by Bengal flares or Ruggieri pots, small panels, etc.; the unit commanders get their unit in order again and reconstitute reserves; the Artillery keeps up its mission of direct support and covering of ensemble until the Infantry is solidly organized on the captured terrain, and its normal liaisons with the rear are established; it gives its barrage the form required by the front held by the Infantry, the latter being revealed accurately by the marking of the first line.

The attack has come to an end; that is the limited attack prepared and desired by the command. But it is a momentary stop in the battle, and the efforts of all will tend to realize new advances, to go right on where the front has been broken, to resume the Artillery preparation where the front has resisted, to attack laterally on the flanks of the zone which resisted in order to outflank and surround them. This phase, at the same time of exploitation and of attack is difficult and toilsome, because the assailants are no longer fighting a battle minutely prepared, but rush into the unknown with an Artillery, deprived of most of its heavy guns, remaining at the rear. But this phase is essential because its more or less successful carrying out will give the battle either the character of a tactical success with limited responsibilities, or the strategical character of a far-reaching victory capable of causing part of the army of invasion to withdraw.

This phase we have not yet known, but we shall certainly know it to-morrow, perhaps, and the matériel difficulties which have not been concealed from you will be palliated to a large extent by the high spirits of troops, enthusiastic over the success and willing to exploit it in view of a decisive victory.







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